Cure For Slipping Platen.

I have a Western Union model 105 page printer, which is similar to a model 15. Lately when the machine tries to turn up a new line, the paper has skidded, with the result being that the next line partially overstrikes the line above. I tried the usual remedies, such as sanding and steel-wooling the platen, but these were only a temporary fix. Today I tried two strips of fine emery cloth glued around the platen just outside where the keys strike, but still within the margins of the paper. The result is perfect paper feed, as though it were sprocket-fed. Merrill Swan is a neighbor of mine, and he saw what I had done, and suggested I send the idea along to you.

The enclosed photograph is of my XYL, Samantha, holding the modified platen. I used white glue to fasten the emery, and it bonded quite well. The printer has been going steady all afternoon, with no more slippage or overstriking.

Hope this solves problems for others!
73, Stan Coutant, WB6WFI

***

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March 1973

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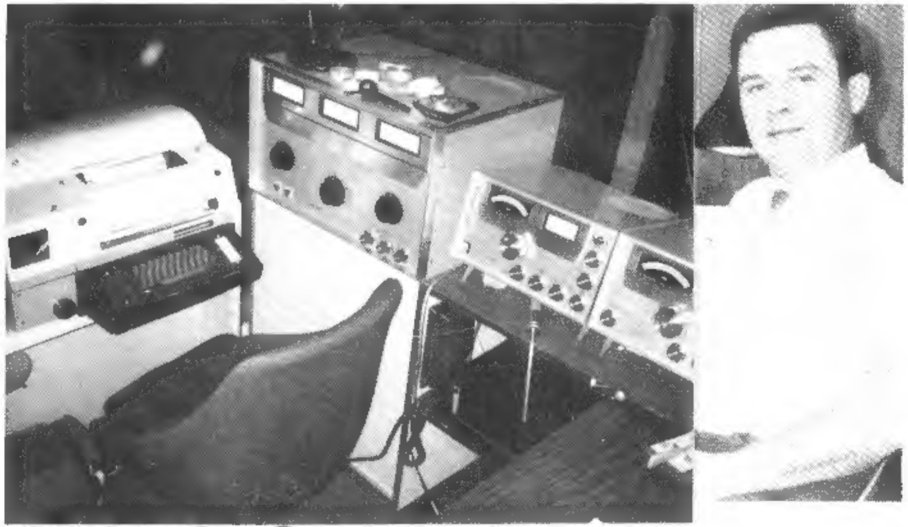

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***

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*****

B.A.R.T.G. RTTY Contest. March 24-26

0200 GMT Saturday, March 24th until 0200 GMT Monday, March 26, 1973. The total contest period is 48 hours but not more than 36 hours of operating time is permitted. Times spent in listening count as operating times. The 12 hour non-operating period can be taken at any time during the Contest, but off periods may not be less than 2 hours at a time. Times on and off the air must be summarized on the Log and Score sheets. The contest is also open to Short Wave listeners.

BANDS. 3.5, 7.0, 14, 21 and 28 Mhz. Amateur Bands.

STATIONS. Stations may not be contacted more than once on any one band, but additional contacts may be made with the same Station if a different Band is used.

COUNTRY STATUS. ARRL Countries List, except that KL7, KH6 and VO to be considered as separate Countries.

MESSAGES - Messages exchanged will consist of:

(A) Time GMT

(B) Message Number and RST.

POINTS. (A) all two-way RTTY contacts with Stations within one's own country will earn **TWO** points.

(B) all two-way RTTY contacts with Stations outside one's own country will earn **TEN** points.

(C) All stations will receive a bonus of 200 points per Country worked including their own. **NOTE** Any one Country may be counted again if worked on another Band but Continents are counted once only.

SCORING. (A) Two way exchange points times total Countries worked.

(B) Total Country points times number of Continents worked.

(C) Add (A) and (B) together to obtain your final score.

Sample Score.

Exchange points (302) x Countries (10) equals 3020

Country points (2000) x Continents (3) equals 6000

(A) and (B) added to give a score of 9000

LOGS AND SCORE SHEETS. Use one Log for each Band and indicate any rest periods. Logs to contain: -

Date, Time GMT, Message and RST numbers sent and received and exchange points claimed. **All Logs must be received by May 31, 1973 to qualify.**

Certificates will be awarded to: The leading RTTY Stations and Short Wave Listeners. The final positions in the Results Table will be valid for entry in the "World Champion of RTTY" Championship. The Judges decision will be final and no correspondence can be entered into in respect of incorrect or late entries. Send your Contest Logs to: Ted Double, G8CDW - 89 Linden Gardens, ENFIELD, Middlesex, England.

(A) If a Contestant contacts 25 or more different Countries on two-way RTTY during this contest he may claim the QUARTER CENTURY AWARD issued by the B.A.R.T.G. and for which a charge of $2. U.S. or 8 IRC's is made. Make your claim when you send in a Contest Log. Holders of existing QCA Awards will automatically have any new additional Countries added.

(B) If any Contestant contacts Stations on two-way RTTY with all 6 Continents and the BARTG Contest Manager receives Contest Logs from the operators in those 6 Continents a claim may be made for WAC Award issued by the "RTTY JOURNAL". The necessary information will be sent on to the "RTTY JOURNAL" who will issue the WAC Award free of charge.

***

TRAFFIC HANDLERS-

To all RTTYr's interested in large volume traffic handling at times when needed over long haul trunk routes, nationwide coverage, limited selection of bands, and definite selected frequencies. Time schedules during daytime hours. It would only take a few of us, taking out of state traffic on phone nets to direct it in any direction over the nation. Monday thru Friday operation. Dependability essential. We could band together as a club and petition ARRL for adjunct inclusion with NTS. Write

Doc W5GY P.O. Box 128, Naples, Texas 75568.

***

40 Meters? Let's Try 7090.

*
*
*

*****

An Interface Between Teletype Loops and Other Devices.

D.E. CHAPMAN,W9DPY
670 N. Elizabeth St.
Lombard, IL. 60148

The writer needed an interface between a teletype loop and a selcall. The primary consideration was that it would work! Secondary considerations were:

1. Simplicity
2. Foolproof
3. Low cost
4. Reliable

One of the standard devices is to use a polar relay to key a battery to operate the selcall. The scheme works very well and isolates the loop from the selcall but -- that is really gilding the lily in this day in age.

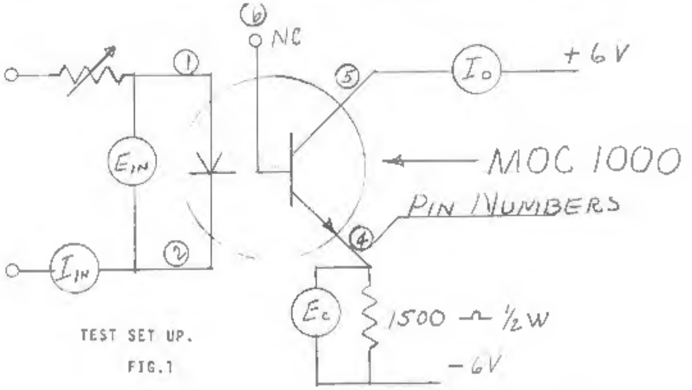
Suddenly the Motorola MOC-1000 series of optoelectronic couplers showed up. Now don't let that big word throw you. The little jewel is about 6 pins of a dual in line type and will fit Augat and other sockets.

Stated simply, the unit is sealed against ambient light and contains a light emitting diode and a photosensitive transistor.

The beautiful part is the LED works from 30-60 milliamperes with very little change and is rated at a maximum of 80 ma continuously. The voltage drop is approximately 1.2-1.3 volts and is resistive so it does not degrade the loop.

Now, considering the selcall, my selcalls operate with about 1.3 volts dc. If 2 volt pulses are available this is about a 60% safety factor.

Accordingly, an MOC 1000 was set up in the circuit of Fig. 1.



TEST SET UP.
FIG.1

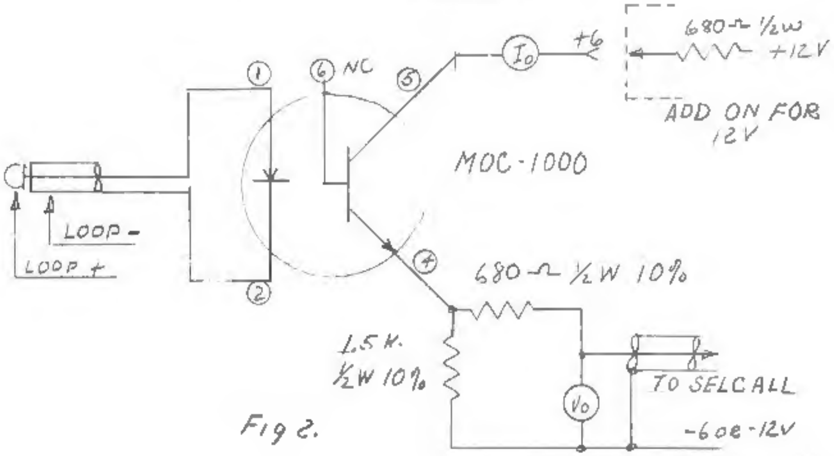


Fig 2.

The results of the test are shown in Table 1.

It is noted that the phototransistor saturated with quite low current thru the diode.

The results were so promising that one of the selcalls was connected as in Fig. 2.

The voltage across the selcall was a little over 2.2 under mark condition of 30 ma (my loops are all 30 mill loops) and about 2.4 volts for 60 mills.

THIS MEANS THE UNIT CAN BE PATCHED INDISCRIMINATELY INTO EITHER 30 or 60 mill loops. In fact the selcall worked so clean that the loop current was dropped to 20 mills with excellent results.

TABLE 1

I-in	I out	V out(Ec)
0	0	0
11ma	4 ma	6V (Note- Max
30ma	4	6 I in 80 ma.)
64ma	4	6.25

TABLE 2
(Operating per fig.2)

14ma	6ma	1.8
28	7.5	2.2
63	10	2.4

12 V. operation-per Fig. 2

10ma	5	1.4	(I in is
18	8	1.9	loop
28	9	2.1	current)
60	10	2.2	

The original tests were run at 6 volts dc (just because a 6 volt nicad was handy!) The tests were again run with 12 volts DC and a 680 ohm 1/2 watt limiting resistor added.

If a 12 volt power supply is needed, get one of the little Fairchild 7812 regulator IC's. This thing is the same size as an MJE-340, and has three terminals. One is tied to about 15-16 volts DC+, the other is tied to DC - and the third goes to the load, together with a lead to the minus. (That is from the load to the - DC.)

Fairchild has the regulator IC's complete in several different voltages 5, 12 and as I recall 18 or 24. The unit is complete in its self and only requires a DC source.

Back to the MOC-1000. The entire unit was so small and simple that no photos were made. With only two or three resistors and the IC it really is a simple interface or keyer for the selcall, with an insulation breakdown of 1500 volts advertised.

If higher currents are to be used on the diode, some sort of shunt limiter should be used.

If your selcall needs more than 2 volts to operate, then the 1500 ohm resistor can be taken off.

I also picked up a couple of ST-3 boards to use this keyer as a loop keyer or "select magnet driver".

CONCLUSION

With this device applied as described, even the old AN/FGC-1 can be used on Selcall, or if the Selcall is properly armed can be used for autostart. The real nice part is you can transfer the Selcall from loop to loop or terminal unit to terminal unit at will!

TRY IT - GOOD LUCK!

***

"Carl" HB9P really takes care of RTTY in Switzerland, above are shown 2 Swiss RT-72 RTTY converters, an electronic HAL keyboard and 5 HAL Video RVD Video Converters ready to be shipped to RTTY fans.

***

"PIET" SIMONIS, WA0WAD

Model 28 CODE CONVERSION

Maj.WERNER FEHLAUER,KL7HKB
392 H Kenai Ave.
APO-SSeattle, WA. 98749

Several amateurs have managed to acquire model 28 teletype machines that were originally in government service, and that operate with a slightly different code than most commercial machines. As we know, a Baudot (5 level) teletype character consists of a start pulse, followed by five information pulses, and ending with a stop pulse. These seven elements can be all of equal time duration, and then are known as a 7.0 unit code. If the stop pulse is 1.42 times as long as the other pulses, the more common 7.42 unit code is described. This variation in the length of the stop pulse determines the unit code at which the machine operates. Available on model 28 machines are gears and cams that provide 6.6, 7.0, 7.42, 7.50, 8.50, and 11.0 unit codes. The most common of course are 7.0 and 7.42. Reasoning behind why each code should be used has been the subject of considerable discussion, controversy, and emotion; an obvious advantage of 7.0 u/c is that with all pulses being the same length, it is easier to electronically manipulate/regenerate the signal; conversely, several amateurs hold the opinion that a longer stop pulse will aid in reception of signals under marginal conditions, by providing a positive synchronizing pulse for each character. The purpose of this discussion is not to argue the relative merits of any code, but to familiarize you with what is involved in converting from one code to another.

Let us assume we wish to convert a model 28 ASR with reperf from 7.0 to 7.42 u/c operation. (Similar changes must be accomplished for the KSR as on the keyboard portion of an ASR). There are four cams on such a machine; one each on the printer, keyboard, reperf, and TD. The cams on the printer and reperf, since they are used in the receive mode only, are the same for all unit codes. Only the sending cams (keyboard and TD) require changing, and several gear sets. If you have Teletype Bulletin 1169B (ASR Parts) available, you can find the necessary info in that booklet - but in case you don't, all parts that require changing are listed below.

On the keyboard base/printer:
  Replace idler gear 163460 with - gear 163440
  Replace main shaft gear 163459 with - gear 163590
  Replace main shaft gear 163503 with - gear 150441
  Replace gear sleeve 163519 with - gear 154032
  Replace keyboard cam 311451 or 173776 with - cam 154154
On the TD:
  Replace cam 164285 with - cam 156836
At the motor:
  Replace speed gear set 173795 (65 WPM) with - set 161293 (60 WPM)
Behind the TD on the main ASR drive shaft:
  Replace speed gear set 159882 or 173776 (65 WPM) with - set 158029 (60 WPM)

Now many people would look at this expensive list of parts (cams are approximately $16.00 each, gears approximately $3.00 each, or essentially in the neighborhood of $60.00 for the conversion parts) and say forget it - afterall, you can receive 7.42 u/c transmissions on a 7.0 u/c machine, and vice versa. So why change?

As mentioned previously, some amateurs have a preference for 7.42 u/c, and the author was greeted with a comment once after sending out a tape at 65 WPM/7.0 u/c, quote: "Geez, what speed is that guy sending?" So, rather than hazarding a lengthy explanation, it was decided to convert the machine to 7.42! (Besides, it is usually possible to horse-trade for the necessary parts with other RTTY enthusiasts and sympathetic repairmen.) So the project began.

Changing the speed gear sets and idler gear is duck soup and does not need explanation as to how it is done. (If you don't agree, we don't recommend you attempt to convert at all, as the rest is much more complicated, tho not impossible by any means!) the TD is next in degree of difficulty, but after removing the TD from its base, removing the nuts, washers, and bearings (if possible) from the cam, it is only necessary to loosen and partially remove the back side plate for the old cam to be removed, clutch mechanism transferred to the new cam, and new cam assembly to be replaced. Remember just how the old cam clutch was positioned in rotation, and put the new cam and clutch together in the same relative positions - it is possible to have the cam 180 degrees out of phase with the clutch! Reassembly is accomplished in reverse order.

Next, the keyboard cam and gear sleeve are replaced by carefully removing the entire assembly including signal generator from the keyboard base in one piece. The shaft, cam clutch and gear sleeve can now be carefully removed, and new parts replaced. Points to watch here are that no forcing should be necessary; keep trying until everything just seems to slip in place. This is especially true when replacing the subassembly on the keyboard base, as the tabs from the keyboard slides must not be bent or jammed, but protrude into the correct recesses next to the cam followers.

Unfortunately, two gears on the printer main shaft must be replaced in order to mesh with the idler gear and gear sleeve. It will take a clear head, lots of patience, and a bit of logical thinking for this swap to be made without having to call in the local repairman. The main shaft will have to be loosened at both ends, and sufficient clutches and arms removed to permit the two old gears to be slid off the shaft and the new ones on. For gosh sakes, don't dismantle more than you have to, or you will be in for an extensive learning experience!

Assuming you have been successful in the foregoing conversion (it can easily be accomplished within 4 hours by a relative newcomer) all that remains is to make sure there is sufficient lube on the new parts, and that the TD and keyboard signal generators are properly adjusted for equal mark/space pulse durations. This latter can be accomplished by several means, but the author has found that a triggered sweep scope connected to the loop while transmitting continuous letter Y's will permit positive and easy adjustment for equal length mark and space pulses. (The adjustment itself is made by moving the signal generator assembly by means of an eccentric screw left or right as appropriate.)

Hopefully, the foregoing will provide the interested RTTY enthusiast with the data needed for conversion from 7.0 to 7.42 unit code. This job, while not as simple as first suspected, is nevertheless possible to be accomplished given reasonable thought and attention. See you on the green keys?

*****

Precision Voltage Supply for Phase Locked Loop TU.

ELLIOTT LAWRENCE, WA6TLA
5435 Columbus Ave.
Van Nuys, Cal. 91401

A previous article (1) described a phase-locked loop tuning unit (PLLTU) which requires a stable, well regulated source of plus 12 volts. The author suggested using a commercially available power supply and described it as "quite a buy for only $38.00." Well hold on to your money fellows and read on.

The power supply described uses an integrated circuit regulator, Motorola MC1469G(2), and two 1% precision resistors as special parts. Everything else should be available from the average RTTY enthusiasts junk box or as surplus. Except for these specific parts, other values and part types are not critical.

Operation and Design

Figure 1 shows the schematic of the precision supply. A full-wave bridge rectifier feeds the regulator. The value of C_1 provides sufficient filtering with the regulator rejecting any remaining ripple. Resistors R_1 and R_2 determine determine the output voltage based on the following manufacture data sheet equations:

$$R_1 \approx (2V_{out} - 7)\ K\Omega$$

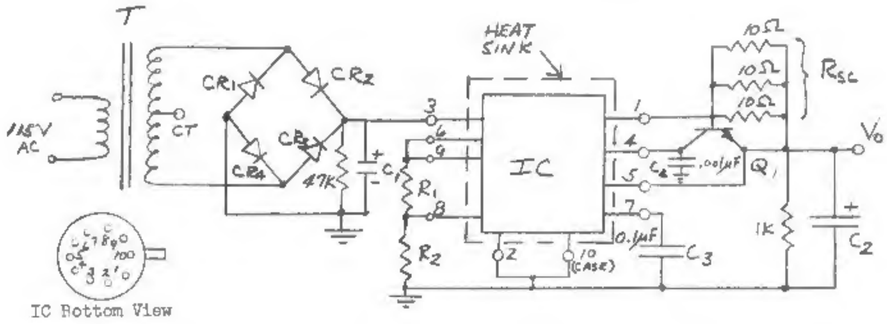
$$R_2 \approx 6.8\ K\Omega$$

Resistor R_{sc} and transistor Q provides short-circuit protection of the regulator. When the output short circuit current (I_{sc}) creates a voltage drop across R_{sc} large enough to turn Q "ON" the regulator output is limited by the saturated collector-emitter across pins 4 and 5. The value of R_{sc} is determined by the equation $R_{sc} \approx (0.6/I_{sc})$ ohms and $C_2 \approx 250$ uF, where I_{sc} is expressed in amperes and C_2 is 250 uF maximum.

Performance

The design tested uses the values shown in the schematic. With the three 10 ohm resistors in parallel, the value of I_{sc} measured was 200 ma. For a nominal load current of 50 ma the output voltage was 12.235 volts. Changing this load current 10 ma caused the output to vary ±1 millivolts corresponding to a load regulation of ±.008%. The power supply showed a .01% change in output voltage with a 7 percent change in the input ac voltage. Both of these characteristics more than satisfy the ±0.1% regulation requirement of the PLL.

The output voltage was deisnged for a nominal 12.0 volts and measured at 12.23 volts. This is explained by the approximately equals sign in the equation for R . The absolute value of the output is stable.



T- 12.6V, 1A
Stancor P-8130 or
equiv. CT not used
CR 1-4 50V PIV minimum
C1 500 uf/50V Electrolytic
C2 10uf/20V Electrolytic
C3, C4 disk ceramic

All resistors ½watt, 10% unless noted.
R1=16.9kohms R2= 6.81kohms
R1, R2 1% metal film 1/8w RN60D
IC Motorola MC1469G or HEP C6049G
Q1 NPN Silicon 2N914 or equiv.

Figure 1: Precision 12 Volt Supply

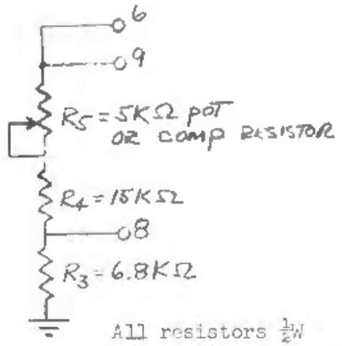
Construction

Layout and construction of the circuit is not critical except that the manufacturer recommends the .001 uF capacitor on pin 4 to have short lead lengths for regulator stability. Vector boards and point to point wiring is a lot easier than trying to one time design a printed circuit board. Sockets were used for the IC and Q1 but are not necessary. Just make sure when soldering the leads that a heat sink is used and it is done quickly to avoid overheating.

An alternate configuration shown in figure 2 can be used in place of the one percent metal film resistors for R and R . R and R_4 are carbon composition resistors and R5 is a multiturn trim pot or a fixed composition resistor. Specific values of R and R is a multiturn trim pot or a fixed composition resistor. Specific values of R4 and R5 are not important so long as they can be varied over the range of desired output voltage. The use of carbon composition resistors will degrade the long term stability of the supply but should not significantly effect TU performance.

Q1 is any general purpose NPN silicon transistor. Rectifier diodes should be greater than 50 volts PIV. A clip-on T0-5 heat sink is used as a precaution because the regulator dissipates approximately 300 milliwatts.

Check the ads in the ham magazines for sources of parts if your junk box won't oblique. Maybe this inexpensive supply will encourage more use of the PLL TU. I wonder if it does really perform better but will find out soon.



All resistors ½W
R5 multiturn mineature pot

FIGURE 2
Alternate Resistor configuration. ...

(1) E. Webb, RTTY Journal - October 1971, Ham Radio January 1972
(2) Available through Circuit Specialists Co., Scottsdale, Arizona

***

RTTY theory & applications

RON 'RG' GUENTZLER, W8BBB
Route 1 Box 30
ADA OHIO, 45810

This is a rerun of the first, of a series of elementary RTTY Theory and operation articles that we published several years ago. With a continual influx of new RTTY fans, and no back issues of the old magazines available, we have received a number of requests for this type of information. Ron Guentzler, the author will continue his VHF column and this series will be run as space permits.

*****

RTTY FOR THE BEGINNER

TELEGRAPH SIGNALS

Beginning with this issue, we are going to discuss some basic topics for the beginner. It is hoped that someone who never has had experience with Teletype will be able to learn enough of the "how" and "why" of it to be able to "get on the air".

We may interrupt the series periodically when matters that "can't wait" come along. Of course, news items will be presented as they are submitted, but the "text", as it were, will be devoted to basic topics.

THE TELEGRAPH

It will be an aid to understanding why present-day Teletype equipment works the way it does if some pertinent historical facts are discussed.

The telegraph was invented and in widespread use before the Teletype. The biggest problems with the telegraph are/were the relatively-slow speed of operation and the necessity for highly-trained operators at each end. The Teletype was invented for the purposes of increasing the speed of operation and using operators with less skill. Because the telegraph was in widespread use when the Teletype came along, much of the then-existing terminology and circuit features were incorporated into the Teletype. In fact, the term "Teletype" is a relatively-new term and is copyrighted. The most commonly-used term for Teletype was "printing telegraph", and it is still common to refer to Teletype equipment and circuits as "telegraph" equipment and circuits. The circuits used for wire-line telegraph and Teletype differ only in the equipment used at the ends.

If we examine a simple telegraph circuit and the "code" used with a hand-keyed telegraph circuit, certain similarities and some gross differences between hand-keyed- and printing-telegraphy will become apparent.

A SIMPLE TELEGRAPH CIRCUIT

Figure 1 shows a simple hand-keyed telegraph circuit. Whenever the key at the sending end is depressed, current flows over the loop or line, thru the sounder, and back to the sending end thru the Earth. The sounder is a simple device having the appearance of a relay without contacts. Whenever current flows in the sounder magnets, the armature on the sounder is attracted by the magnets, and as the armature strikes the stop it makes a click or a "sound".

(The code used on wire-line telegraphy, the Morse code, and the code used by radio amateurs for CW operation are not the same code, although they are similar. The wire-line Morse Code used clicks of the receiving sounder while the radio code uses bursts of tone.)

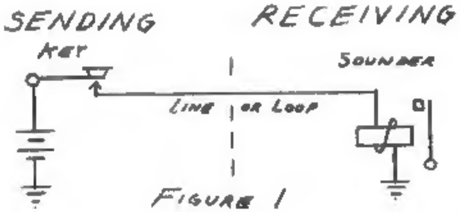


FIGURE 1

One of the objections to telegraphy as just described is the necessity for an operator to be present at the receiving end to listen to the sounder and write down what was sent as it was being sent. One solution to this problem was to have some type of device at the receiving end to make marks on a moving strip of paper in order to automatically receive a message when no receiving operator was present. The "automatic recorder" consisted of a simple arrangement containing a pen fastened to the armature of a modified sounder. Whenever the key at the sending end was depressed, the armature on the "modified" sounder would move placing the pen in contact with the moving paper and a mark was made upon the paper. When the sending key was opened, no current flowed, the armature on the "sounder" was released, and the pen was withdrawn from the paper thus making a "no mark" or a space. Because of this mode of operation the term "mark" has been used to mean the presence of current in a telegraph circuit be it hand-keyed or Teletype. No current in the circuit was, of course, called a "space". (Incidentally, the recorded message consisted of a series of "dots" and "dashes" on the paper, and someone who knew the code was required to read the message).

Before continuing with a description of hand-keyed telegraph circuits, it will be shown how a Teletype machine fits into the scheme of things.

THE TELEPRINTER

A discussion of a teleprinter requires a separate, detailed description for each model. However, such a description would, at this point, only serve to confuse the issue. Therefore, we will take an almost oversimplified approach in order to discuss what the device does without burdening the reader with the "how" details. Some poking and peering into the innards of a teleprinter should answer a lot of questions once the "what is it supposed to do?" is answered.

There is a great similarity in outward appearance between a teleprinter and a typewriter. There are some things in common between these two devices, but the similarity soon ends when the innards are examined. In a typewriter, there is a more-or-less direct connection between each key on the keyboard and the type bar in the typebasket. When a key is depressed, the corresponding type bar is actuated.

An inspection of a teleprinter will reveal that for all practical purposes, a teleprinter is two separate machines having in common only the motor, the base, and the cover. One of the "machines", called the "keyboard" or the "keyboard-base", is composed of the keys and some device for translating the characters on each key into an electrical signal. The translation is done, commonly, by means of a mechanical arrangement that "tells" the distributor which key has been depressed. The distributor is, in effect, nothing more than a set of contacts operated by a motor. The contacts open and close at a fixed rate dependent upon the "speed" of operation (which is determined by the motor speed), and in a pattern depending upon the character or letter being snet. The distributor simply replaces the telegraph key in the circuit shown in Figure 1, as shown in Figure 2.

The keyboard essentially replaces the telegraph key, but in addition, the "code" to be used is "stored" in the keyboard rather than in the operator's head. For example, when a manual-telegraph operator wants to send the letter "R", he must translate "R" into a code combination of dots, dashes, and spaces and then operate the telegraph key in that code sequence. When using a teleprinter, the operator only has to know where the "R" key is located. He then depresses the "R" key and the teleprinter takes over from there; it translates "R" into the code corresponding to that letter and opens and closes the contacts corresponding to that code. (Incidentally, lest the reader be misled, the code used for hand-keyed telegraphy and the code used for Teletype are not the same. This will be discussed later.)

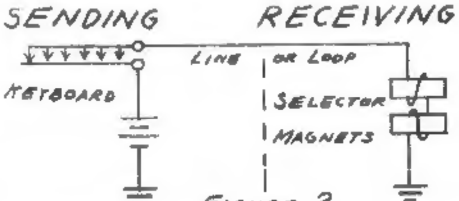


FIGURE 2

The "other machine" under the cover is a decoding and printing mechanism. It is driven by a motor and operated by means of an electrical signal applied to the windings of a magnet. This magnet simply replaces the sounder in a manual circuit. The magnet operates, mechanically, a device known as a selector that translates or "decodes" the incoming signal and determines what letter or character is to be printed. Therefore, in effect, the printer receives the code, decodes it, and prints the corresponding character automatically, whereas with a manual system an operator is required to receive, decode (mentally), and write the character.

Again, it should be stressed that a teleprinter is essentially two independent devices. In fact, it is possible to "split" the machine and send something from the keyboard while receiving something else on the printer. (Of course, it is also possible to have the two portions connected and have the printer print something other than what is being "typed" on the keyboard; this is known as "trouble"!)

Thus far we have a great similarity between manual and "printing" telegraphy. There is one major difference however: The code that is used.

THE CODE

Perhaps a little insight into why the teleprinter code is the way it is, or at least why it is not the same code that is used for manual telegraphy can be obtained as follows.

Figure 3(a) shows two manual telegraph characters and Figure 3(b) shows what they would look like when viewed on an oscilloscope.

In Figure 3(a) the letters "E" and "Q" are shown. They appear as a combination of "marks" and "spaces" between the marks. In Figure 3(b), the corresponding pattern as viewed on an oscilloscope is shown where current flowing corresponds to a "mark" and no current flowing corresponds to a "space".

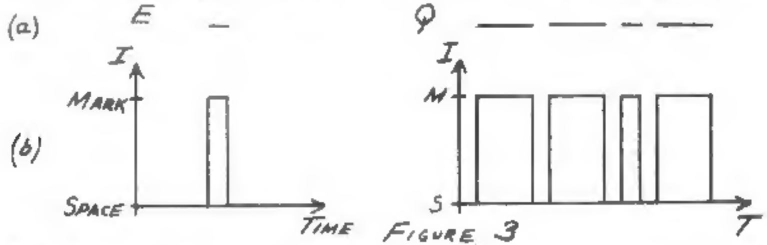


FIGURE 3

The code used for hand-keyed telegraphy is a rather ingenious combination of short and long "marks" and "spaces". The long marks are called dashes and the short marks, dots. Short spaces are used between the marks within a single character, medium-length spaces are used between characters (letters), and long spaces between words. Also, the code is set up in such a way that the more-frequently-used letters are composed of relatively-short combinations of marks and spaces (the letter E is just one short mark) while the infrequently-used characters are composed of many long and short marks and short spaces (the letter Q is composed of one long mark, one short space, one long mark, one short space, one short mark, one short space, and one long mark; no wonder it was so hard to get that CW speed up!).

This code used for hand-keyed telegraphy is suitable for operation by a person when sending to a person, but if it were to be used between two machines a major problem would develop. As mentioned, the hand-keyed characters are composed of many different-length combinations of marks and spaces and the overall character length (the time to send a complete letter) varies greatly from letter to letter; for example, the letter "Q" requires 13 times as long to send as does the letter "E". This variable-character length is a desired (or at least a not undesirable) situation when people are doing the operating, but think of the problem in devising a machine to do this! Actually, the sending "machine" would be relatively easy to construct, but the receiving "machine" would be something else. Why? Mechanical devices inherently are easiest to construct and work best when a constant, fixed length of time is required for the machine to do something. Feeding a mechanical thing a source of information that may vary over a 13:1 range (actually more if the digit O is considered) and then expecting it to digest that and always give a single response (operating one type bar) is a bit much! Therefore, the answer was/is a completely different type of code that always uses the same length of time to send a character regardless of the particular character being sent.

A code that always uses the same length of time to send a character regardless of the character is the Baudot code (the code used by teleprinters). It consists of five even-length marks and spaces, and always five even-length marks and spaces regardless of the character. Because every character is always composed of five marks and/or spaces of even length it is "naturally" suited to operation from/to a mechanical device. Because there are five portions to the signal, there are only 32 characters possible. (2X2X2X2X2 32). This explains why a teleprinter has only 32 keys and why the arrangement of keys has to be somewhat different from that of a typewriter.

We will continue next month by discussing the Baudot code.

73, ES CUL, RG

*****

RTTY-DX

JOHN POSSEHL - W3KV
Box 73 Blue Bell, Pa., 19422

Hello there . . .

If you had been planning to be off the air to overhaul the ham gear or perhaps to take a vacation trip, January would have been a good time for it. Conditions and activity were at a pretty low ebb and it seems that for the first time in many months no new country became active on RTTY.

By the time you receive this the first part of the Giant Flash Contest is just about to start and we would like to point out a few changes in the rules for this popular Contest. Most of us active in contests are prone to assuming that the rules remain the same year after year, and in fact, they pretty well do. However, it does pay to read the fine print occasionally. This year for the Giant Flash Contest each U.S. (W0 to W9) and Canadian (VO to VE7) call area will count as a separate "country". Since each country counts as a multiplier on each band it is worked the total multiplier possibilities will be increased tremendously. In addition, the Matrix table that has been used for the past several years to determine the Zone points has been revised, at least for this contest. The points have been reduced in all cases from the previous Matrix in general use. However, there seems to be a discrepancy in that in several instances the points do not come out the same in both directions as they should. An example of this is that from Zone 32 to Zone 16 counts 29 points but from Zone 16 to Zone 32 counts 10 points! You can easily check this out by starting at the 2 point box and going to the right and UP, box by box, and to the left and DOWN. The numbers should come out the same. We are not aware that the Matrix has been published but it has been distributed along with log sheets to those that took part in previous Flash Contests. We imagine that many in the Contest will be using the previously published Zone charts and some will be using the new Zone chart, which along with its errors will be something of a problem for the contest committee to iron out. Off hand I would think that if everyone uses the higher of the two numbers where there is a conflict it would cut down the Committee's problem by half. The other half is the equalization of points between the two Matrix by the Committee when they receive the logs. Thanks to Paul, KH6AG, for reading the "fine print" and bringing this to our attention.

Of course the natural disaster in Nicaragua in December shocked the entire world by its destruction and loss of life. I think too that more than a few of the RTTY gang wondered about the fate of Gun, YN1CW, who had been quite active as the only RTTY station active from that country, particularly since he was located in Managua. While we do not have any direct word of his well being, we can say that we did copy YN1CW on 80 meter CW handling traffic from Managua to the Los Angeles area.

It does not take long for a "May Day" call to get action going on RTTY. Jim, YJ1JS, told Gin, JA1ACB, that toroids were badly needed to get his TU going. There were none available in Japan so Gin passed word to Uli, DK3CU. None there either, so Uli got word to Charlie, W5QCH, and they were in the mail on the way to New Hebrides the following day.

Carl, K6WZ, tells us that Tahiti is really going all out on RTTY. When Henri, FO8BS, left the island Phil, FO8-BO, jumped in and has done a fb job keeping the prefix active, particularly as a rare multiplier in Contests. Right now there is RTTY activity from Richard, FO8CI; Gerard, FO8BY; Coco, FO8BX; and soon to follow will be FO8CS. It seems that Gerard has been building up ST-6's at an assembly line rate and machines are apparently available, hence all the activity. Carl points out that this represents about ten percent of the total ham population of Tahiti.

Henri, now LU2ESB is very active these days particularly on 15 Meters. The call book has not quite caught up to him yet so here is his present QTH. We might add that Henri is very prompt on QSLing too.

Henri Coste
Florencio Varela 471
BECCAR - Pcia. B.S.
Argentina

During a recent QSO with ZD9BM on Tristan da Cunha (in another mode) of course the inevitable question was asked. No, they do not have any RTTY gear there but were told that ZD9GC on Gough Island does and that he occasionally ventures forth on the ham bands and when he does it is around 14080 khz. Tristan and Gough are only about 200 miles apart and Roy on Tristan said he would try to urge him to get up there more often next time he talks to him on the inter island net. So we will see what happens. Someone that is fortunate to net him may try talking him into making it a weekly event, at least.

As we mentioned last month, 9G1WW is now definitely QRT. Emile does wish to particularly thank W9YGN for getting the gears that made his activity possible and to W5VJP and K5FPW for starting the fire under him and for the support they provided in putting Ghana on the RTTY country list.

We are sorry to say that another rare RTTY station will shortly be QRT. Mike, TU2DD, will be leaving for France in April and at this time we do not know if he will return or if there is a replacement station to take over for him.

7Q7JO has been showing up on the band just long enough to get everyone excited but patient listening particularly on 15 meters may reward you with a contact. Joe's QTH is --

J.A. McElvenney
Malawi Police Hq.
P.O. Box 41
Zomba, Malawi

The first WAC Certificate to be issued in 1973 goes, with our congratulations, to --

Nr. 206 Lew Holt W7AAI

Lew hails from way up in Oregon and has been trying for the WAC since 1967 and it appears that a QSL from 9G1WW finally put him over the top.

Gentlemen, it is time to sync watches for the ever popular B A R T G Spring Contest - Commence at 0200 GMT, Saturday, March 24th. See full rules in this issue.

Keep the machine warmed up for the RTTY WAEDC, April 28th, 0000 GMT will be the starting time.

73 de John

*****

FSK for the SB-102

TIMOTHY JUHL, WA8QWR
4225 E. Chandler
Carsonville, MI. 48419

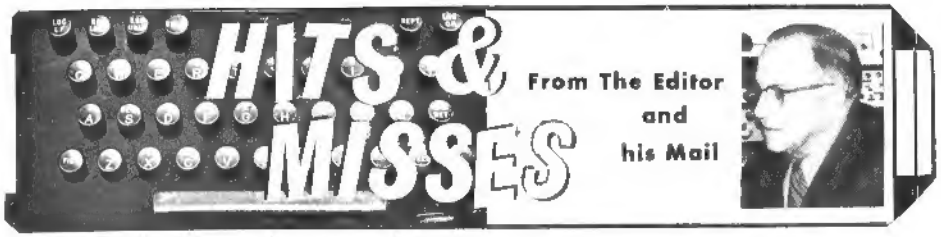
I have recently been in contact with the Heathkit Company of Benton Harbor, Michigan, concerning what must be done to use the Heath SB-102 for Rtty. The following description deals only with the transmitter section of the SB-102, as without internal modifications the SB-102 will not transmit and receive on the same frequency for RTTY transceive operation. In my situation, I use a separate receiver, so any internal modification of the SB-102 was avoided.

The Heath company wishes to stress that using the SB-102 for RTTY operation is at "your own risk," and suggests that to avoid damage to the unit, a fan should be provided over the final amplifier compartment, and that the power amplifier screen current must be lowered to keep the plate input to 150 watts or less. This can be done by using a resistor in place of the jumper on the 9-terminal cable socket. Heath points out that a 47 k (1 2 watt) resistor will drop the plate input to about 70 watts, so I used a 50 k potentiometer, which allows me to adjust the power input to any level I wish.

FSK- the SB-102 has a very stable solid-state VFO, with a built in FSK circuit using a voltage-variable capacitor connected to a terminal on the rear of the VFO. This terminal, when grounded through a one megohm potentiometer, will shift the VFO frequency up to about 1,000 Hz. If your keyer circuit supplies a negative dc voltage on mark and a positive dc voltage on space (Mainline TTL, ST-5, ST-6 and ~~et~~.), you may use the following circuit to key your SB-102's FSK circuit. The positive dc voltage associated with the space signal turns Q1 on, and the one megohm pot is used to adjust the amount of frequency shift. The negative dc voltage associated with the mark signal back-biases D1, turning Q1 off, allowing the VFO to return to its original frequency.

I have used this circuit and it seems to work very well. I have received many compliments on my stability and shift quality, which is what prompted me to use the SB-102 in the first place. My thanks to James Isham, W8TXX, technical consultant, and the engineering staff at Heathkit for furnishing me with the preceding information.

***



The Dayton Hamvention, largest in the country, is April 27-28 at Wamplers Arena the usual site but with increased space this year. As usual the RTTY JOURNAL will have a hospitality suite. This year however it will be at the Imperial North Motel rather than the Dayton Sheraton Hotel. Easy parking and closer to the exhibition buildings. Ron Guentzler, W8BBB is arranging and will moderate the RTTY session with a good program assured. Irv Hoff, W6FFC, the designer of many popular RTTY first will talk as well as someone from HAL Communications.

Several other informed RTTY experts will fill out the program which we should have in detail next issue. But if you are planning to attend we suggest an early room reservation as the motel sells out for this event. In any event plan to visit us at our hospitality room, the "South Room" at the Imperial. We should have Kentucky Kool Ade, Wheeties and even some "soft drinks" to keep you happy.

***

A number of comments on use of 40 meters for RTTY were received. Apparently it is like a lot of bands, everybody listens - but there is nothing to listen to - so they pass on. We might suggest that 7090- or thereabout- be used just to see if a standard meeting place will bring on some action. It is a potentially good band with even DX possibilities if, some signals were on to encourage more use.

***

We had several requests for an article that would give a digital (nixie) read out of shift of signal being sent or received (say from 000 to 999) and a device that would give a digital read out of the speed of a RTTY signal. Nice idea eh? Any body any ideas?

***

We hope to attend the Great Lakes ARRL Convention in Muskegon March 23-24. Full details from PO Box 691, Muskegon, Mi. 49443.

***

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New subscriptions and classified ads are cash in advance as we have no method for billing. New subscriptions will be started with the current issue and one back issue, if requested. Please do not ask us to start any further back than this. Back issues - if available - may be ordered at 30¢ each at time of subscription. The JOURNAL is mailed about the 20th of the month preceding the dated month. May and June are a combined issue and July-August is a combined issue.

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Editor & Publisher **'Dusty' Dunn, W8CQ**

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BACK ISSUES OF RTTY JOURNAL - I have a complete file of all issues from Vol. 1 No. 1 to date. Will reproduce any issue for $1.10 pp. Add 25¢ for air mail delivery. John Isaacs, 3175 Val Verde Ave., Long Beach, CA. 90808

11/16" PERFORATOR TAPE, 40 roll case - $7.95. Sprocket feed paper, $3 per box (FOB). "Teletype Equipment, Supplies and Information for the Radio Amateur," FREE LIST. BVE, POB 73-R, Paramus, NJ 07652.

TYPEWRITER RIBBON RE-INKER; Hand operated model now only $3.50. K575 or K764 ink available at all National Cash Register Stores. 75¢ per tube. Walter Nettles, W7ARS, 8355 Tanque Verde Rd. Tucson, AR 85715.

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WANTED: STELMA PC-334, PC-336 or PC-403 PC plug in or any information on these. G. S. Samwada, JA1ACB, 3-4-8, Izumi, Hoya, Tokyo 188, Japan.

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KLEINSCHMIDT MANUALS - for TT-4, TT-100, TT-76, TT-107, etc. Mite KSR teletypewriter supplies, gears, parts, covers. Wanted Teletype manuals. Send SASE for list. Typetronics, Box 8873 Ft. Lauderdale, FL. 33310. W4NYF.

HAL COMMUNICATIONS CORP: Announced the revolutionary new RVD-1002 and RKB-1 solid state RTTY system. Provides the ultimate in noiseless, reliable reception and transmission of Baudot coded TTY. The RVD-1002 visual display system receives demodulated TTY pulses from the ST-6 and provides video output to a video monitor, or modified TV set. One thousand (1000) characters are displayed in a 20 line, 50 character per line format, at 60, 66, 75, and 100 WPM if your TU will copy it. The RKB-1 combines reliable TTL circuitry, a high quality commercial keyboard, and a rugged case to provide the best Baudot TTY keyboard available. The electronics is arranged so that you type as if you were using a typewriter.. See them on display at Muskegon and Dayton. Get the details from HAL Communications Corp., Box 365RJ, Urbana, Il 61801. Phone 217-359-7373.

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